PATENT APPLICATION

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, Colorado 80527-2400

ATTORNEY DOCKET NO. ___200205522-1___

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):   Doron SHAKED

Application No.: 10/676,944

Filing Date: October 2, 2003

Confirmation No.: 6923

Examiner: Jeffrey S. Smith

Group Art Unit: 2624

Title: A METHOD TO SPEED-UP RETINEX-TYPE ALGORITHMS

Mail Stop Appeal Brief - Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF REPLY BRIEF

Transmitted herewith is the Reply Brief with respect to the Examiner's Answer mailed on ___June 11, 2008___ .

This Reply Brief is being filed pursuant to 37 CFR 1.193(b) within two months of the date of the Examiner's Answer.

(Note: Extensions of time are not allowed under 37 CFR 1.136(a))

(Note: Failure to file a Reply Brief will result in dismissal of the Appeal as to the claims made subject to an expressly stated new ground rejection.)

No fee is required for filing of this Reply Brief.

If any fees are required please charge Deposit Account 08-2025.

☐ I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, Alexandria, VA 22313-1450

Date of Deposit:

OR

☒ I hereby certify that this paper is being transmitted to the Patent and Trademark Office facsimile number (571) 273-8300.
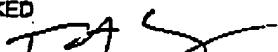Date of facsimile: August 11, 2008

Typed Name: Judy H. Chung
Signature:

Total number of pages: 14

Respectfully submitted,

Doron SHAKED

By _____

Timothy B. Kang

Attorney/Agent for Applicant(s)

Reg No. :   46,423

Date :   August 11, 2008

Telephone : (703) 652-3817

Rev 10/07 (ReplyBr)

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, Colorado 80527-2400

Attorney Docket No.: 200205522-

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Doron SHAKED	Confirmation	5923
U.S. Serial No.:	10/675,944	Examiner:	Jeffrey S. Smith
Filed:	October 2, 2003	Group Art	2624
For:	A METHOD TO SPEED-UP RETINEX-TYPE ALGORITHMS		

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY BRIEF - PATENTS

Sir:

The Appellant respectfully submits this Reply Brief in response to the Examiner's

Answer mailed on June 11, 2008, and thus this Reply Brief is timely filed within two months

of the Examiner's Answer.

PATENT

Atty Docket No.: 200205522-1
App. Ser. No.: 10/675,944

TABLE OF CONTENTS

PAGE

2

PATENT

Atty Docket No.: 200205522-1
App. Ser. No.: 10/675,944

I.   **Status of Claims**

Claims 1-12, 14-20, 22, and 23 are pending in the present application.

Claims 13 and 21 have been canceled.

Claim 22 is allowed.

Claims 4-12 and 16-20 are objected to but have been indicated as being allowable if rewritten to include all of the limitations of the base claim and any intervening claims.

Claims 1-3, 14, 15, and 23 stand rejected.

Pursuant to 37 C.F.R. § 41.37, the Appellants hereby appeal the Examiner's decision finally rejecting Claims 1-3, 14, 15, and 23 to the Board of Patent Appeals and Interferences. Therefore, Claims 1-3, 14, 15, and 23 of this application are at issue on this appeal.

3

PATENT   Atty Docket No.: 200205522-1
                                                   App. Ser. No.: 10/675,944

II.   Grounds of Rejection to be Reviewed on Appeal

Whether Claims 1-3, 14, 15, and 23 should have been rejected under 35 U.S.C. §

103(a) as being unpatentable over WO 02/089062 to Kimmel et al. (hereinafter "Kimmel et

al.") in view of the disclosure contained in the background section of the present

Specification (hereinafter "admitted prior art") and further in view of U.S. Patent Application

Publication No. 2004/0091164 to Sakatani et al. (hereinafter "Sakatani et al.").

In the Appeal Brief, the Appellant erroneously indicated that the grounds of rejection

to be reviewed on appeal included review of the "Requirement for Information" under 37

C.F.R. § 1.105 and whether the drawings should have been objected to under 37 C.F.R. §

1.83(a) for allegedly failing to show the features of Claims 14-20 and 22. The Appellant

therefore withdraws those grounds of rejection from the present appeal.

4

PATENT   Atty Docket No.: 200205522-1
                                                    App. Ser. No.: 10/675,944

III.   Argument

        A.   Claims 1-3 and 23

                Kimmel et al. Fails to Disclose a Non-Linear Illumination Estimation Module

        The Examiner asserts that "figure 2 of Kimmel shows an iterative estimator 104 that

estimates illumination using a non-linear max operation as shown on page 3." This assertion

is improper and mischaracterizes the iterative estimator 104 described in Kimmel et al. (WO

02089062).

        In making this argument, the Examiner refers to lines 19-27 in page 3 of Kimmel et

al. That section of Kimmel et al. pertains to the background section of the Kimmel et al.

patent and although Kimmel et al. does not explicitly state that the iterative estimator 104

does not perform the described "'reset' non-linearity", there is nothing in that section to

indicate that the iterative estimator 104 performs the "non-linear (max) operation" described

therein. In fact, it appears that Kimmel et al. seeks to improve upon the approach described

in that section as evidenced by the discussion on lines 28-31 on page 3.

        Instead, Kimmel et al. discusses the iterative estimator 104 on lines 17-19 of page 6 as

an "image processing module 104 [that] uses a Projected Normal Steepest Descent or similar

algorithm, with multi-resolution processing, to compute an estimate 107 of the illumination,

designated in Figure 2 as *l**." Thus, there is no clear indication that the image processing

module 104 estimates illumination using a non-linear max operation as asserted by the

Examiner.

5

PATENT   Atty Docket No.: 200205522-1
                                             App. Ser. No.: 10/675,944

*Regardless of the Discrepancy in the Rejection, the Examiner has Failed to
Establish Obviousness of Down-sampling Input Images in Kimmel et al.*

The Examiner argues that it would have been obvious to replace the linear

illumination estimation module 30 (depicted in Figure 2 of the present application) with the

log module 102 and the iterative estimator 104 (depicted in Figure 2 of Kimmel et al.). (See

Examiner's Answer, page 9, lines 19-21). There is some discrepancy in this argument

because the Examiner also argues that the "non-linear estimation device of Kimmel includes

log module 102, non-linear module 104, and summer 108". (See Examiner's Answer, page

4, lines 17 and 18). It should be noted that Kimmel et al. never refers to the iterative

estimator 104 (or image processing module 104) as a "non-linear module 104", and that, the

Examiner has named the element 104 as such. As discussed above, the Examiner has

mischaracterized the image processing module 104 as using a non-linear max operation.

Assuming that the Examiner intended to replace the linear illumination estimation

module 30 with the log module 102, non-linear module 104, and the summer 108 as stated on

page 4, lines 17 and 18 of the Examiner's Answer, the proposed combination fails to disclose

the asserted features of Claims 1 and 23. Kimmel et al. discusses on page 6, lines 19-23, that

the estimate 107 of the illumination is combined with the output 103 (s) at summer 108 to

produce an estimate 109 of the reflectance (r^*), which "is converted from a logarithm to its

corresponding base number value at exponential module 110, to produce a number value as

an estimate 111 of the reflectance (designated as R^*)." In other words, Kimmel et al.

discloses that the summer 108 combines the estimate 107 of illumination (l^*) with an output

103 (s) to produce an estimate 109 of the reflectance (r^*). As such, the combination

proposed by the Examiner would result in the input into the up sample module 34 (Figure 2

6

PATENT

of the present application) comprising the reflectance (r*) and not an interim illumination estimation as claimed in Claims 1 and 23 of the present invention.

Assuming that the Examiner intended to replace the linear illumination estimation module 30 with the log module 102 and non-linear module 104, without the summer 108, as stated on page 9, lines 19 and 20 of the Examiner's Answer, the Examiner has failed to establish that the proposed combination is proper and would yield the present invention as claimed in Claims 1 and 23.

The Examiner asserts that it would have been obvious to down-sample input images prior to inputting the input images into the log module 102 of Kimmel et al. This assertion is improper because the Examiner has failed to provide any evidence that one of ordinary skill would have been motivated to both down-sample images and produce logarithms of the down-sampled images. Instead, the Examiner has merely stated that down-sampling is desirable as a means for speeding up the computationally intensive Retinex process.

Sakatani et al. fails to make up for the Deficiencies in Kimmel et al.

Although the Examiner acknowledges that Kimmel et al. fails to disclose an upsampling module as claimed in Claims 1 and 23, the Examiner argues that Sakatani et al. (US 2004/0091164) and the alleged admitted prior art disclose these features. In addition, the Examiner argues that the discussion contained on paragraph 118 of Sakatani et al. and on page 3 of the present application, disclose "an upsampling module that uses the input image as a guide in the interpolation for the benefit of performing Retinex type processing...".

Initially, even assuming for the sake of argument that the combination of Kimmel et al., Sakatani et al., and/or the alleged admitted prior art proposed by the Examiner is proper,

7

PATENT

the proposed combination fails to make up for the other deficiencies in Kimmel et al.
discussed above. More particularly, for instance, the proposed combination fails to disclose a
non-linear illumination estimation module that receives sub-sampled images as claimed in
Claims 1 and 23.

Secondly, as discussed in the Appeal Brief, paragraph 118 of Sakatani et al. recites
that the resolution of the original and blurred images are matched with each other to execute a
Single Scale Retinex calculation. More particularly, that paragraph states that the resolution
of a blurred image is changed to match the resolution of an original image by interpolation.
As such, Sakatani et al. discloses that the resolutions of images are matched with each other
and thus does not disclose that interim illumination estimations are interpolated to produce an
illumination estimation by using an input image as a guide in the interpolation. For at least
the foregoing reasons, the proposed combination of Kimmel et al. and Sakatani et al. fails to
disclose all of the features of independent Claims 1 and 23.

The Examiner's discussion from the alleged admitted prior art regarding "using the
high resolution input image S to select corresponding output pixels' when 'the interpolation
is performed on a set of smooth, low resolution intermediate images'" pertains to illumination
manipulation module 20 and not to the up-sampling module 34. This is clearly evidenced in
Figure 2, which depicts the high resolution images L" and the high resolution input image S
being inputted into the illumination manipulation module 20. As such, that cited passage of
the alleged admitted prior art also fails to disclose an up-sampling module that is configured
to interpolate interim illumination estimations to produce an illumination estimation by using
an input image as a guide in the interpolation.

8

PATENT   Atty Docket No.: 200205522-1
                                          App. Ser. No.: 10/675,944

The Examiner's response to this argument is that "[t]he fact that the admitted prior art

uses the original image as a guide in interpolation performed by the illumination

manipulation module 20 does not preclude an engineer of ordinary skill in the art from using

the original image as a guide in the interpolation performed by the up-sampling module 34, as

taught by Sakatani in paragraph 117." (Examiner's Answer, page 11, lines 3-7). This

response is confusing at best and improper at worst. From this response, the Examiner

apparently agrees that the alleged admitted prior art fails to disclose that the up-sampling

module 34 performs an interpolation using the original image as a guide, but the Examiner

still rejects Claims 1 and 23 as if the up-sampling module 34 uses the original image as a

guide in the interpolation. (See, Examiner's Answer, page 6, lines 12-14). Thus, it is not at

all clear as to how the Examiner has interpreted the admitted prior art.

For at least the foregoing reasons, it is respectfully submitted that the proposed

combination of Kimmel et al., the admitted prior art, and Sakatani et al. fails to disclose each

and every element claimed in Claims 1-3 and 23 of the present invention. Accordingly,

assuming only for the sake of argument that one of ordinary skill in the art were somehow

motivated to combine these disclosures as suggested by the Examiner, the proposed

combination would fail to disclose all of the features of the claimed invention. Clearly,

therefore, the proposed combination fails to teach or suggest all of the claimed elements, and

thus, the Examiner has failed to establish a *prima facie* case of obviousness based upon these

documents.

9

PATENT   Atty Docket No.: 200205522-1
                                                   App. Ser. No.: 10/675,944

B.   Claims 14 and 15

In the Official Action dated September 4, 2007, in rejecting Claim 14, the Examiner
asserted that Kimmel et al. discloses "producing one or more low resolution input images by
sub-sampling the high resolution input image, generating an interim illumination estimation
for each of the one or more low input resolution images, and producing a Retinex corrected
output." (page 6, lines 15-18). As argued in the Appeal Brief, the Examiner failed to identify
which sections of Kimmel et al. the Examiner relied upon in setting forth this rejection and
thus, this rejection is improper. In response to that argument, the Examiner has stated that
"Claims 14 and 15, which have elements similar to apparatus claims 1 and 3 expressed in
method form, are rejected for reasons given in the rejection of claims 1-3." (Examiner's
Answer, page 11, lines 11-16).

However, on page 7, lines 5-21, the Examiner has apparently changed his position by
withdrawing the assertion that Kimmel et al. discloses any of the claimed features in Claim
14. More particularly, there is nothing in the rejection of Claim 14 that references Kimmel et
al. and it is not at all understood why Claim 14 was rejected based upon the disclosure
contained in Kimmel et al. In fact, it appears that the Examiner has modified the rejection of
Claim 14 to be based solely on alleged admitted prior art and the disclosure contained
Sakatani et al., thus removing any reliance on Kimmel et al. One result of this change is that
the rejection set forth on page 7 is improper and confusing.

For instance, if the Examiner is now asserting that the admitted prior art discloses all
of the features of Claim 14, then it is unclear as to how or why one of ordinary skill in the art
would have been motivated to modify the alleged admitted prior art as argued in the last
paragraph of page 7 in the Examiner's Answer. In addition, it is not at all clear as to which

10

illumination estimation the Examiner is referring in that paragraph. For at least this reason, the rejection of Claim 14 is confusing and improper and should thus be withdrawn.

The Examiner has now argued that the alleged admitted prior art discloses all the features of Claim 14. However, the Examiner also relies upon the disclosure contained in Sakatani et al. In addition, although the Examiner agrees that the alleged admitted prior art fails to disclose that the up-sampling module 34 performs an interpolation using the original image as a guide, the Examiner still rejected Claims 14 and 15 as if the up-sampling module 34 uses the original image as a guide in the interpolation. (See, Examiner's Answer, page 6, lines 12-14). Again, the rejection is unclear and should be withdrawn.

In any regard, the rejection of Claims 14 and 15 is clearly improper for at least the reasons presented above with respect to Claims 1-3, and 23. More particularly, for instance, the alleged admitted prior art fails to at least disclose that an interim illumination estimation is generated for each of one or more low resolution images, and generating an illumination estimation suitable for Retinex-type correction by up-sampling the interim illumination estimations by combining the input image and the interim illumination estimations. In addition, Sakatani et al. fails to make up for the deficiencies in the alleged admitted prior art. For instance, paragraph 118 of Sakatani et al. recites that the resolution of the original and blurred images are matched with each other to execute a Single Scale Retinex calculation, which indicates that the resolution of a blurred image is changed to match the resolution of an original image by interpolation. As such, Sakatani et al. discloses that the resolutions of images are matched with each other and thus does not disclose that interim illumination estimations are interpolated to produce an illumination estimation by using an input image as a guide in the interpolation. For at least the foregoing reasons, the proposed

11

                                                    Atty Docket No.: 200205522-1
                                                    App. Ser. No.: 10/675,944

combination of the alleged admitted prior art and Sakatani et al. fails to disclose all of the

features of independent Claim 14.

   For at least the foregoing reasons, it is respectfully submitted that the proposed

combination of Kimmel et al., the alleged admitted prior art, and Sakatani et al. fails to

disclose each and every element claimed in Claims 14 and 15 of the present invention.

Accordingly, assuming only for the sake of argument that one of ordinary skill in the art were

somehow motivated to combine these disclosures as suggested by the Examiner, the proposed

combination would fail to disclose all of the features of the claimed invention. Clearly,

therefore, the proposed combination fails to teach or suggest all of the claimed elements, and

thus, the Examiner has failed to establish a *prima facie* case of obviousness based upon these

documents.

PATENT   Atty Docket No.: 200205522-1
                                             App. Ser. No.: 10/675,944
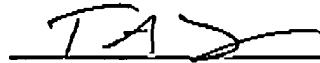
IV.   **Conclusion**

For at least the reasons given above, the rejections of Claims 1-3, 14, 15, and 23 are

improper. The Appellant therefore respectfully requests that the Board of Patent Appeals and

Interferences reverse the Examiner's decision rejecting Claims 1-3, 14, 15, and 23 and to

direct the Examiner to pass the case to issue.

Respectfully submitted,

Dated: August 11, 2008   By   _____
                                          Timothy B. Kang
                                          Registration No.: 46,423

                                          MANNAVA & KANG, P.C.
                                          11240 Waples Mill Road
                                          Suite 300
                                          Fairfax, VA 22030
                                          (703) 652-3817
                                          (703) 865-5150 (facsimile)

13